

WHAT IS CLAIMED IS:

1. A device for the analysis of liquid comprising:
  - a mechanical means to take a sample of a liquid to be analysed and means to convey it before
  - 5       - a spectrophotometric analysis means of the device, this analysis means preferably emitting a light spectrum in the infrared through the sample presented in an analysis cell of this analysis means,
  - a means for measuring an absorbance spectrum obtained after passage through the sample, this measurement means being linked to
  - 10       - a mathematical processing means, this means comprising a memory in which spectroscopic criteria are recorded, and comprising a computation means to correlate the spectroscopic criteria and the absorbance spectrum so as to determine concentration levels of different constituents, wherein
  - 15       the stored spectroscopic criteria enable the automatic determining of the concentration levels of specific constituents of wine and/or grape musts and/or fermenting musts, for example:
    - gluconic acid concentration revealing the presence of a first microbiological agent and/or
    - 20       - acetaldehyde or ethyl acetate concentration revealing the presence of a second microbiological agent and/or
    - acetic acid or ethyl acetate concentration revealing the presence of a third microbiological agent and/or
    - lactic acid concentration revealing the presence of a fourth
    - 25       microbiological agent.
  - 2. A device according to claim 1, wherein the first microbiological agent is *Botrytis cinerea*, and can also be revealed as the case may be by concentration levels of mannitol, or sorbitol present in the liquid.
  - 3. A device according to claim 1, wherein the second
  - 30       microbiological agent consists of yeasts, and can also be revealed, as the case may be, by concentration levels of arabitol, 2,3-butanediol, methyl-3-butanol-1, glycerol and/or isoamyl acetate present in the liquid.
  - 4. A device according to claim 1, wherein the third microbiological agent consists of acetic bacteria and may also be revealed, as the case may
  - 35       be, by a concentration of 2,3-butanediol.

5. A device according to claim 1, wherein the fourth microbiological agent consists of lactic bacteria, and may also be revealed, as the case may be, by concentration levels of mannitol and/or 2,3-butanediol.

5 6. A device according to claim 1, comprising a second means of spectrophotometric analysis, this second means of analysis preferably emitting a light spectrum in the visible and the ultraviolet domains through the sample presented in the second test stand, and comprising a second means for the measurement of an absorbance spectrum obtained after passage  
10 through the sample, this measurement means being connected to the mathematical processing means.

7. A device according to claim 1, comprising means to create a quality index from the results of the mathematical processing means.

8. A device according to claim 7, wherein the means for creating  
15 the quality index comprise

- a means to select the concentration levels of the components to be considered in this index, and
- a means to assign each of these concentration levels a scale of points as a function of the value of the concentration.

20 9. A method for the spectrophotometric analysis of a liquid comprising the following steps:

- a sample of a liquid to be analysed is taken, and
- it is conveyed into an analysis cell of a means of spectrophotometric analysis,
- 25 - a continuous spectrum is emitted with the analysis means in the infrared through the sample presented,
- an absorbance spectrum obtained after passage through the sample is measured,
- using a mathematical processing means, spectroscopic criteria and absorbance spectrum are correlated so as to determine concentration levels  
30 of different constituents of this liquid to be analysed,

wherein

- in a memory of the mathematical processing means, a recording is made of the spectroscopic criteria by which it is possible to automatically  
35 determine at least concentration levels of specific constituents of the wine

and/or grape musts and/or fermenting musts, for example:

- concentration of gluconic acid revealing the presence of a first microbiological agent, and/or

5       - concentration of acetaldehyde and/or ethyl acetate revealing the presence of a second microbiological agent, and/or

- concentration of acetic acid and/or ethyl acetate revealing the presence of a third microbiological agent, and/or

- concentration of lactic acid revealing the presence of a fourth microbiological agent.

10       10.    A method according to claim 9 wherein

- the analysed liquid is discharged into a waste receptacle.

11.    A method according to claim 9 wherein

- the automatically determined concentration levels of the components are displayed on a computer screen or printed.

15       12.    A method according to claim 9 wherein

- a quality index is created from the results of the mathematical processing means,

- to this end, the concentration levels of the constituents to be considered in this index are selected and each of these concentration levels is assigned a scale of points as a function of the value of the concentration.

20       13.    A method according to claim 9 wherein

- the sample is taken into a second analysis cell of a second means of spectrophotometric analysis,

25       - a continuous spectrum is emitted with the analysis means in the infrared and the visible domains through the sample presented,

- an absorbance spectrum obtained after passage through the sample is measured,

30       - using the mathematical processing means, spectroscopic criteria and absorbance spectrum are correlated so as to determine concentration levels of different constituents of this liquid to be analysed,

14.    A method according to claim 9 wherein the first microbiological agent is Botrytis cinerea and wherein

- a recording is made, in a memory of the mathematical processing means, of the spectroscopic criteria enabling the automatic determining of the concentration levels of mannitol and/or sorbitol present in the liquid in

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order to reveal it.

15. A method according to claim 9, wherein the second microbiological agent consists of yeasts, and wherein

- a recording is made, in the memory of the mathematical processing means, of the spectroscopic criteria enabling the automatic determining of the concentration levels in arabitol, 2,3-butanediol, methyl-3-butanol-1, glycerol and/or isoamyl acetate present in the liquid in order to reveal them.

16. A method according to claim 9, wherein the third microbiological agent consists of acetic bacteria, and wherein

- a recording is made, in the memory of the mathematical processing means, of the spectroscopic criteria enabling the automatic determining of the concentration of 2,3-butanediol present in the liquid in order to reveal it.

17. A device for the analysis of liquid comprising:

- a mechanical means to take a sample of a liquid to be analysed and means to convey it before
- a spectrophotometric analysis means of the device, this analysis means preferably emitting a light spectrum in the infrared through the sample presented in an analysis cell of this analysis means,
- a means for measuring an absorbance spectrum obtained after passage through the sample, this measurement means being linked to
- a mathematical processing means, this means comprising a memory in which spectroscopic criteria are recorded, and comprising a computation means to correlate the spectroscopic criteria and the absorbance spectrum so as to determine concentration levels of different constituents,

wherein

the stored spectroscopic criteria enable the automatic determining of the concentration levels of specific constituents of wine and/or grape musts and/or fermenting musts, for example:

- concentration of a component revealing the presence of *Botrytis cinerea*, and/or
- concentration of a component revealing the presence of yeasts, and/or
- concentration of a component revealing the presence of acetic bacteria and/or
- concentration of a component revealing the presence of lactic

bacteria.

18. A device according to claim 17 comprising a second means of spectrophotometric analysis, this second means of analysis preferably emitting a light spectrum in the visible and the ultraviolet domains through the sample presented in second test stand, and comprising a second means for the measurement of an absorbance spectrum obtained after passage through the sample, this measurement means being connected to the mathematical processing means.

19. A device according to claim 17, comprising means to create a quality index from the results of the mathematical processing means.

20. A device according to claim 19, wherein the means for creating the index of quality comprise:

- a means to select the concentration levels of the components to be considered in this index, and
- a means to assign each of these concentration levels a scale of points as a function of the value of the concentration.

21. A device according to claim 17 wherein, to reveal the presence of *Botrytis cinerea*, the concentration of gluconic acid present in the liquid and, if necessary, the concentration levels of mannitol, and/or of sorbitol present are considered.

22. A device according to claim 17 wherein, to reveal the presence of yeasts, the concentration levels of acetaldehyde and/or ethyl acetate present in the liquid and, as the case may be, the concentration levels of arabitol, 2,3-butanediol, methyl-3-butanol-1, glycerol and/or isoamyl acetate present are considered.

23. A device according to claim 17 wherein, to reveal the presence of acetic bacteria, the concentration levels of acetic acid and/or ethyl acetate present in the liquid and, as the case may be, the concentration of 2,3-butanediol are considered.

24. A device according to claim 17 wherein, to reveal the presence of lactic bacteria, the concentration level of lactic acid present in the liquid and, as the case may be, the concentration levels of mannitol and/or 2,3-butanediol are considered.

25. A device for the spectrophotometric analysis of a fluid (2) comprising a first spectrophotometer, the first spectrophotometer comprising

a first light source and a first detector positioned on either side of a first test stand, the first light source emitting in the first range of wavelengths towards the first test stand, the device comprising a second spectrophotometer [(18)] comprising a second light source and a second detector positioned on either  
 5 side of a second test stand, the second light source emitting in a second range of wavelengths towards this second test stand.

26. A device according to claim 24 wherein the second range of wavelengths corresponds to an ultra-violet and/or visible range of wavelengths.

10 27. A device according to claim 24, wherein the first light source and the second light source may have a joint emission spectrum with wavelengths ranging from 0.1 micrometers and 20 micrometers.

28. A device according to claim 24, comprising a probe to measure the conductivity of the fluid.

15 29. A device according to claim 24, comprising a mathematical processing means to process absorbance values given by the two spectrophotometers.

30. A device according to claim 24, wherein the two spectrophotometers are placed in series.

20 31. A device according to claim 24, wherein the two spectrophotometers are placed in parallel.

32. A device according to claim 24, wherein the liquid to be analysed is an alcoholic or non-alcoholic aqueous liquid, or a human or animal liquid.

25 33. A method according to claim 9, wherein the fourth microbiological agent consists of lactic bacteria, and wherein

- a recording is made, in the memory of the mathematical processing means, of the spectroscopic criteria enabling the automatic determining of the concentration levels of mannitol and/or 2,3-butanediol present in the  
 30 liquid in order to reveal them.

34. A device according to claim 24 wherein the first range of wavelengths corresponds to a mean infrared and/or near infrared range of wavelengths.

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B<sub>2</sub>